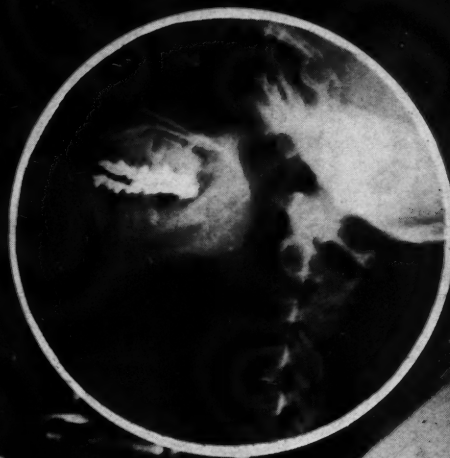


September 1952

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Dental Digest

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SEPTEMBER 1952

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M. HILLEL FELDMAN, D.D.S. (New York University, College of Dentistry, 1909) presents a case history dealing with the conservative treatment of an ameloblastoma. The procedure proved to be eminently successful.

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ORAL ORTHOPEDICS

Its Nature, Significance, and Application

THE GROUP FOR ORTHOPEDIC RESEARCH IN DENTISTRY*, New York

DIGEST

Dentists are accustomed to thinking of centric occlusion and centric relation as being the normal and established positions of the jaws. Further, they have accepted the dictum of authority that the determination of these positions provides the starting point for all prosthetic procedures. It is believed that once these positions have been determined the jaws are in the best possible relation to each other. However, there is considerable evidence to the contrary, and increasing knowledge concerning the nature of jaw relations has stimulated consideration of the propriety as well as the possibility of changing improper jaw relations when such malrelations occur. This article discusses the nature and potentialities of oral orthopedics and presents the rationale and outlines the procedures used in this type of treatment.

Jaw Relations

Established at birth, jaw relations are supposed to be normal and, whether normal or not, are believed to be unchanging from birth throughout life. The fact is, however, that jaw relations which may or may not have been normal at birth may become altered through a variety of influences such as malocclusion, scattered loss of teeth, development of abnormal muscle habits, and other factors.



1. Anteroposterior roentgenogram showing nature's architectural plan for the support of the maxillary teeth. The interrupted ruled lines superimposed on the shadows of the bony structure delineate the dental cone. (Courtesy of Dental Concepts)



Effects of Altered Jaw Relations—Such altered jaw relations alter tooth relations and may then initiate traumatic occlusion or compound an existing traumatic occlusion. Periodontal problems, to say nothing of restorative problems, thus become extremely complex and may at times seem to be virtually insoluble. Another point: Altered jaw relations may have effects outside the mouth itself, such as pain in the region of the temporomandibular joint.

Advisability of Change—Increasing awareness of this situation has led to a consideration of the advisability and feasibility of changing existing incorrect jaw relations in certain cases for the total benefit of the patient. The conclusion has been reached that when jaw relations are incorrect it is necessary to guide the mandible into proper relationship in order to eliminate or control any symptoms which may be present, or if symptoms are not present, to consider making such a change from the

2. Study models of a case presenting an extreme overbite of the upper anterior teeth before treatment. Note cusp-over-cusp relationship of the bicuspids and molars on both sides. Note evidence of edema of the gingivae.

preventive aspect. This proposal, of course, runs counter to the generally accepted dictum that the position of the mandible and the accompanying position of the head of the condyle in the temporomandibular fossa are inviolable. There are signs, however, that this dogma is beginning to break down. Greene,¹ Robinson,² Frank,³ Walsh,⁴ Nove,⁵ and others have conducted studies which by plain in-

ference if not openly expressed opinion indicate that exceptions to this rule can be made and that, in fact, the foundation of the dogma is not sound. These observations serve to substantiate the pioneer work of Stoll⁶ in this field.

Diagnosis of Malposture a Requisite—If it is considered necessary to change the position of the mandible in certain cases it is of course imperative to organize diagnostic procedures for the determination of the cases in which change is needed. And it is also necessary to provide exact procedures by which the mandible may be guided to its optimal position. These procedures have been developed and systematized, and have been given a distinctive and suitable name.

Oral Orthopedics

Oral orthopedics is an advanced development in dentistry based on

¹Greene, E.: The Posture of the Mandible, *Am. J. Orthodont.* **28**:210-221 (April) 1942.

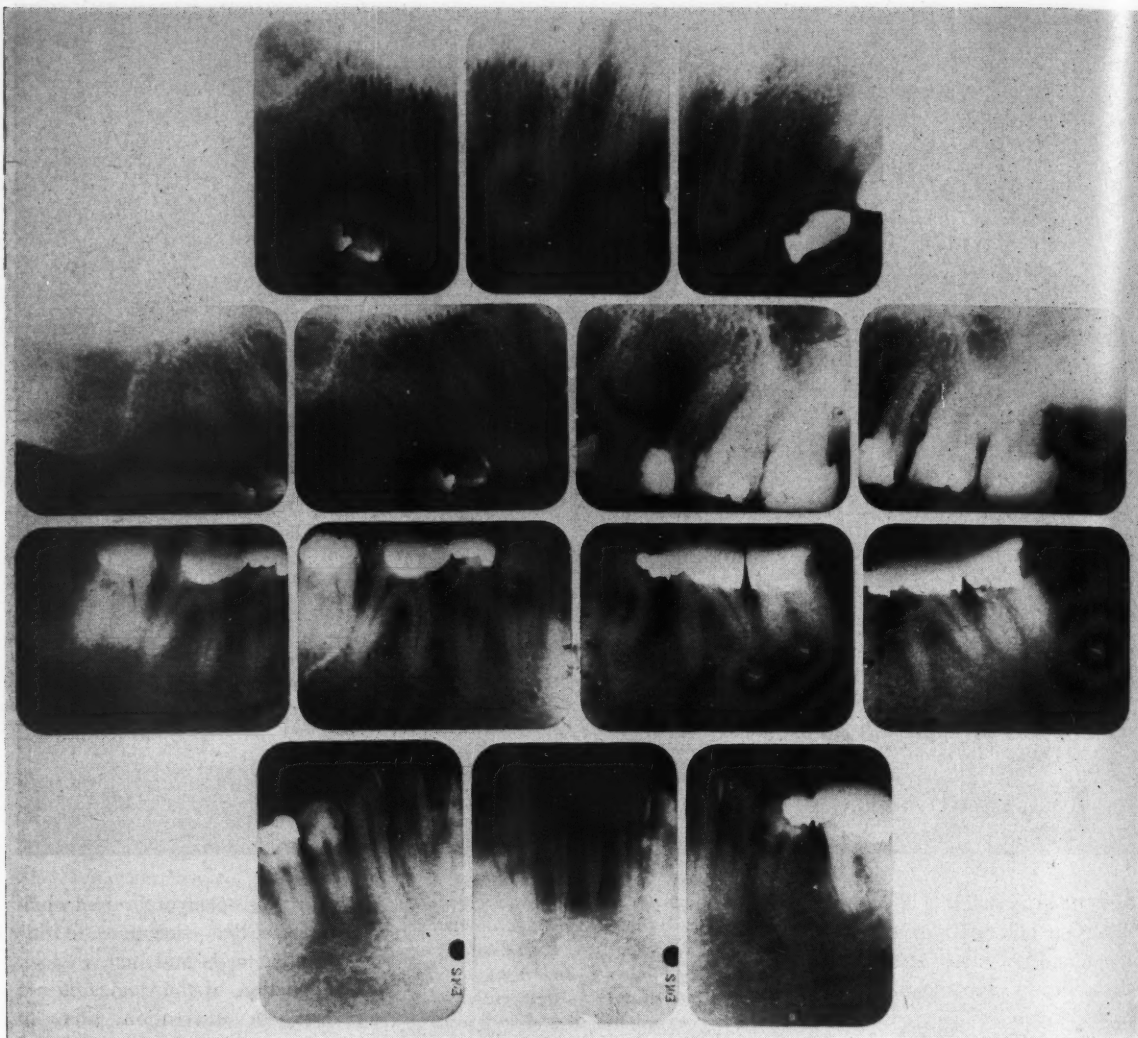
²Robinson, M.: The Temporomandibular Joint. Theory of Reflex Controlled Non-lever Action of the Mandible, *J.A.D.A.* **33**:1260-1271 (Oct.) 1946.

³Frank, Leonard: Muscular Influence on Occlusion as Shown by the X-rays of the Condyle, *DENTAL DIGEST* **56**:484 (Nov.) 1950.

⁴Walsh, J. P.: Neurophysiological Aspects of Mastication, *Dent. J. Australia* **33**:No. 2, 49-62 (Feb.) 1951.

⁵Nove, A. A.: Articles in Dental Record, referred to in 1946 Year Book of Dentistry, pp. 535-591, Chicago, Year Book Publishers, 1946.

⁶Stoll, Victor: The Importance of Correct Jaw Relations in Cervico-Oro-Facial Orthopedics, *Dental Concepts* **2**:5-13 (April) 1950.



recent appreciation of the fact that improper relationship of the mandible to the maxilla not only can occur but actually is present in a large number of cases. It has been found that when such malrelationship exists it results in unbalanced occlusion with the unhappy sequelae of that condition, and often in other difficulties not hitherto recognized as having an oral relationship.

Oral orthopedics, then, may be defined as the concept of dental science and art concerned with postural relationships of the jaws, both normal and abnormal; analysis of the harmful influence of improper relationship of the mandible to maxilla on dental and other related structures; the diagnosis and correction of such malrelationships and the treatment or

3. Roentgenograms of the case shown in Figure 2 before treatment. Note the less than normal density of the interproximal alveolar bone around the upper and lower anterior teeth. The lower right second bicuspid was extracted because of pulp involvement. The first molar was devitalized.

prevention of disturbances resulting therefrom.

If correct occlusion is the foundation of dental science and art, as has often been maintained, oral orthopedics, by providing a method for obtaining optimal occlusal relationships, supplies the maximum refinement of oral biomechanics for the benefit of the patient. The usual concept of balanced occlusion is insufficient to

encompass the range of oral orthopedics. It is not enough merely to secure the best attainable occlusal relations of the teeth themselves. Fundamental to that is the requirement of obtaining optimal postural relations of the mandible to the maxilla.

Requisites for Complete Health—Studies of anatomy, physiology, neuromuscular function and the biomechanics of the body have led to a realization that the correct posture of the mandible is essential to correct posture of the head on the spine and that, in turn, to total body posture and balance as requisites to optimal health.⁷ Thus the concepts embraced in oral orthopedics have been de-

⁷Todd, M.: *The Thinking Body*, New York, Hoeber, 1939.



4. Study models of the case shown in Figures 2 and 3, after treatment. Note the reduction of the anterior overbite and improved interdigitation of the posterior teeth accomplished by increasing vertical dimension and repositioning the mandible. Note also the evidence of reduction of gingival edema in all areas.

veloped on the broadest physiologic foundation.

Dentist's Concern with Orthopedics—The question is sometimes asked, "Why should orthopedics concern the dentist?" Actually, every dentist practices orthopedics, perhaps without realizing it, since he must concern himself with the relations of the jaws as well as the teeth in all his restorative procedures.

Effects of Improper Jaw Relations

The effect of improper jaw relationships in regard to derangement of dental function, impairment of facial symmetry, and pathogenic influence on the oral structures is well known. Recognition of needs in these fields has become an important influence, for example, in the development of modern orthodontics.

Periodontal disease, too, is known to be strongly influenced by traumatic occlusion and it is now recognized that improper relationships of the jaws and of individual teeth related thereto may be responsible for

the development of traumatic occlusion. Disturbance of neuromuscular patterns traceable to mandibular malposture also assumes at times an important role in the etiology of periodontoclasia. This relationship has not been fully appreciated heretofore.

Effects in Remote Areas—Even less well recognized is the harmful influence of mandibular malposture on related structures of the head, neck, and throat, and even in remote areas. Pathologic and painful syndromes induced by such malrelationships include pain in the temporomandibular area and pain radiation to the head, neck, mouth, tongue, throat, ears, and eyes. Others involve muscle spasm in various groups of muscles in the head

and neck. Dentists are becoming increasingly aware that pain, also clicking in the temporomandibular joint, are commonly related to a disturbance of the structures in that area. That in many instances this is produced by a malposture of the mandible and that such malposture should and can be corrected has not so far been appreciated by the profession. Dentists need to realize also the possible oral implications of the other syndromes mentioned. Some of these, while not common, occur more frequently than has been generally realized by either dentists or physicians, and are a matter of concern to both professions.

Malposture of the Mandible—Malposture of the mandible and malocclusion primarily present orthopedic problems. This does not mean that they are entirely problems of mechanics, however, since their occurrence usually gives rise as well to neuromuscular disturbances which take the dentist into the field of disturbed physiology. At the same time these malrelations, because they are in themselves disturbances of a struc-

tural nature, require study from the structural standpoint. This study starts with an analysis of the dental apparatus, consisting of the teeth, jaws, immediately adjacent structures, and related parts.

The Concept of Geometric Orientation and Posture

Examination of essential anatomic forms in nature shows clearly the underlying geometric basis of structural development.⁸ The four-footed animal is an example of nature's application of geometric principles in providing for optimal relations in the maintenance of balance. The center of gravity is easily kept within the area enclosed by the animal's four feet.

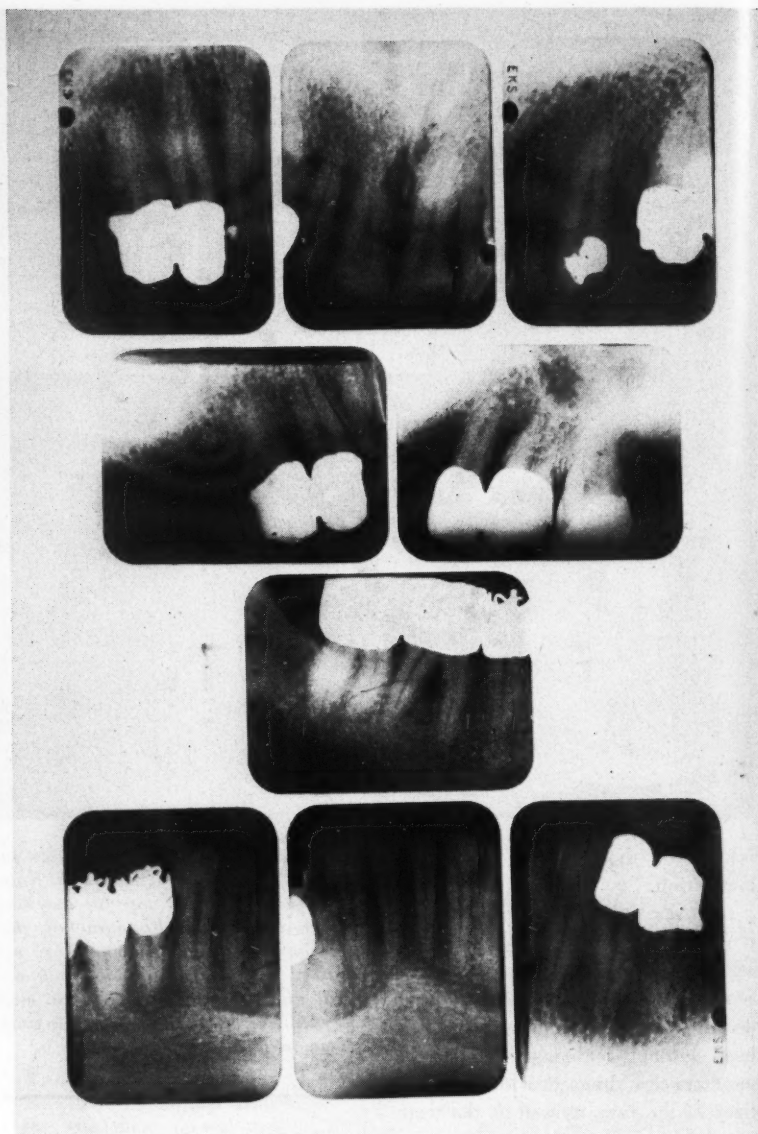
Man, a two-legged animal, has a smaller area of support for the body, hence more strict provision must be made for keeping the center of gravity within the area covered by the feet and thus maintaining balance. This necessitates a posture determined on a plumb line which, dropping from the head, passes down through the body, emerging within a relatively small area.

In order to permit maintenance of balance from the head downward through the entire skeletal column with a minimal expenditure of energy, the head itself must be erect and correctly related to the spine. And it has been found furthermore that the posture of the head on the spine is influenced by the posture of the jaws and the dental mass.

Posture and postural relationships are usually analyzed on the basis of orientation planes which serve to locate bodies in space. This concept of relationship in space applies not only to the body as a whole but to the head and the dental mass as parts of the body.

Imbalance a Cause of Abnormalities—If the body is out of balance, abnormal demands will be made on the various muscles concerned and this, if continued, will lead to abnormalities in both form and function with manifestations of fatigue

⁸Lieb, M. M.; Kudler, G. D.; Ritt, R.; Friend, A. A.; and Curry, J. E.: *Oral Orthopedics, Dental Concepts* 4:No. 1 (Jan.) 1952.

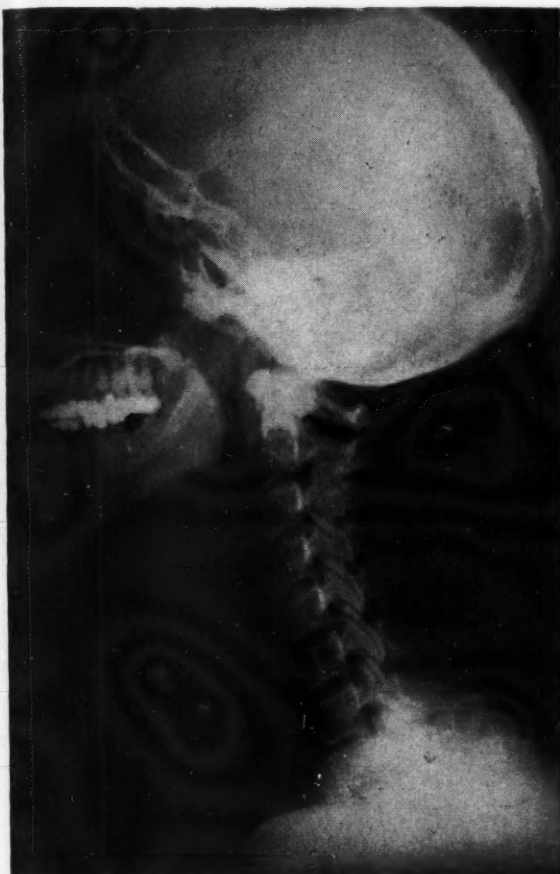


5. Roentgenograms of the case shown in Figures 2, 3, and 4 after treatment. Note the increased density of the interproximal alveolar bone around the anterior teeth. (The lower right molar region is not shown because the film was damaged.)

and discomfort within the area or referred elsewhere. A similar situation may be found in the dental mass itself if not in proper relation and balance.

Nature's geometric plan is carried out also in the dental mass. For example, the roots of the maxillary teeth incline toward a center in the skull; the roots of the mandibular teeth have a corresponding outward inclination. Study of the maxillary inclination indicates that those teeth

with the extension of their long axes upward constitute the conical segment of a sphere whose center is located in the skull in the area of the glabella. The convergence of extensions of the long axes of the teeth can be observed in an anteroposterior roentgenogram. This demonstrates the existence of an efficient architectural pattern (Fig. 1) by means of which adequate bone support is provided for the maxillary teeth.



6. Lateral head roentgenograms of a case with marked retrusion of the mandible. Note the relation of the mandible to the maxilla, the narrow pharyngeal space, indicated by the close relation of the shadows of the mandibular rami to those of the first and second cervical vertebrae. Note that there is a slight anterior curvature of the cervical spinal column.



7. Lateral head roentgenogram of the case shown in Figure 6. The patient's mandible is protruded temporarily, bringing the teeth into better mesiodistal relation. Note

that the pharyngeal space is wider than in Figure 6 and that the cervical spine is straighter. The head is more upright on the spine (compare the space between the base of the skull and the posterior process of the atlas in the two figures). The relation of the mandible to the maxilla is not ideal at this point. Further repositioning is needed to correct the superior tilt of the posterior segment of the mandible. This will be done by depressing this segment, thus achieving the required parallelism of the alveolar ridges.

The concept of the dental cone is not new, Monson proposed it many years ago and some of his ideas have been carried down through the years and further clarified. The significance of Monson's structural analysis based on geometric principles has not been fully realized until the present. Monson, however, did not develop functional analysis to the level that has since been reached.

Correct Posture of the Mandible Essential

Before attempting to diagnose the abnormal it is necessary for the den-

tist to have in his mind a clear concept of the normal. In anatomy "normal" is generally recognized as being not one set standard but a standard with permissible slight variations, these being qualified as positions within physiologic range. Such variations may be considered as being within normal limits provided they do not appreciably affect structure, or influence adversely the balance of muscular activity. This qualification applies in the study of jaw posture as well as tooth position.

With a clear mental picture of the normal, the dentist is prepared to

recognize the abnormal as that which exhibits a deviation beyond the normal range of permissible variations. In a broadening concept of jaw relations, the definition of the normal must embrace more than just relations of the teeth themselves. It is also necessary to consider jaw position in relation to the head and, in turn, the posture of the head on the spine.

It is acknowledged that good posture of the body, statically and dynamically, is essential for good health and conservation of energy; and the first prerequisite for good body pos-

ture is alinement of all the skeletal parts in harmony with gravity and balance. Correct posture of the mandible actually is a prerequisite for good body mechanics and physical fitness.

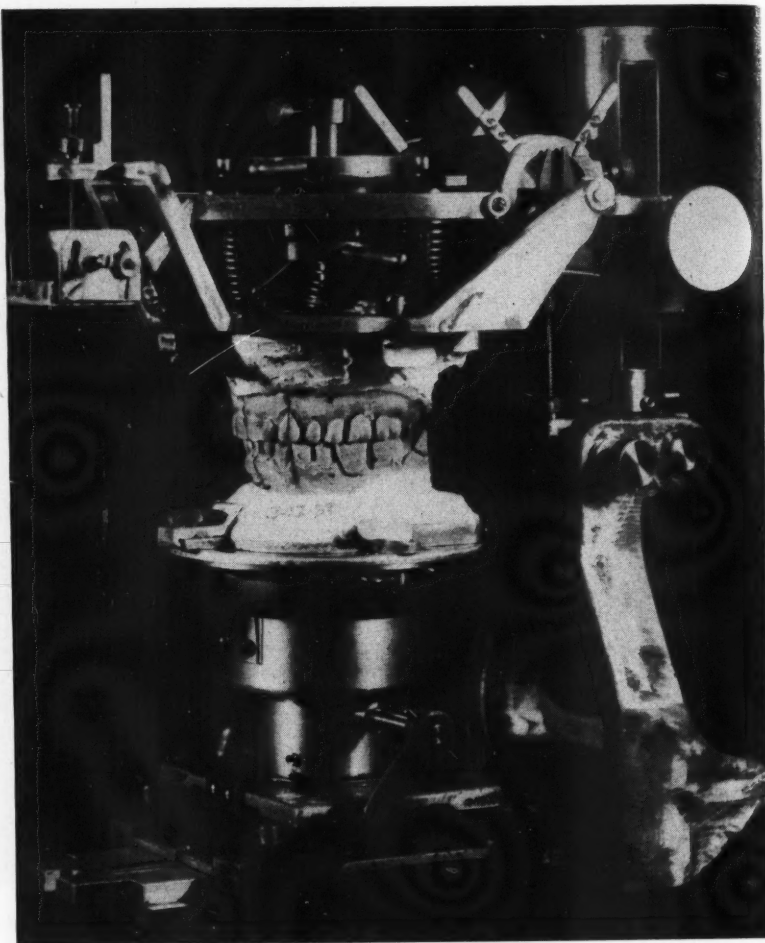
The Neuromuscular Postulate

Stoll⁹ has stated that "in normal health the neuromuscular system is so regulated that the muscles are in a definite tonic state, ready for action, and so synchronized that each muscle receives from the nervous system the proper supply of neural energy for the performance of its assigned work with perfect precision and rhythm, and without interference with the function of other muscles. When a part of the body, e.g., the mandible, assumes an abnormal position in relation to the rest of the body, the postural requirements for maintenance of balance of the body against gravity are disturbed, and in order to maintain body equilibrium and balance, one set of muscles is called on to function at the expense of others." It puts a strain on these muscles and this may lead to increased tensions and cause various symptoms, such as muscle spasm and distant referred pain secondary to the disturbed posture. Jaw malposture further interferes with esthetics by distorting facial muscles and underlying bony structures.

Where jaw malposture is the cause it is clear that repositioning the mandible is required as a means of obtaining relief. This involves as well cases in which the patient has discomfort in the mouth itself and fatigue of the muscles concerned with the functioning dental apparatus.

As stated before, disturbance of neuromuscular patterns brought about by mandibular malposture may initiate pathologic conditions in the periodontal and other oral tissues, the malposture being a causative factor acting in concert with the purely local influence of traumatic occlusion. (It is often true, also, that jaw malposture itself may be caused by traumatic occlusion.)

⁹Stoll, Victor: The Importance of Correct Jaw Relations in Cervico-Oro-Facial Orthopedics, Dental Concepts 2:5-13 (April) 1950.



3. The Stoll geometric analyzer with study models mounted. In addition to providing conventional movements of the maxillary member, the analyzer provides also for shifting the mandibular member forward and back, and sideways. It can also be tilted in any direction on the hemisphere in its base. By virtue of the unlimited range of movement provided for in the mandibular member, it is possible to place the mandibular model in any desired relation to the maxillary model. The maxillary member may be raised and lowered, thus providing for increasing vertical opening when that is found to be needed.

Typical Cases Requiring Correction of Improper Jaw Relations

Repositioning of the mandible is needed in certain types of cases, depending on the degree of deviation of jaw relations and posture. Notable examples are (1) cases with marked closing of the bite, (2) cases with scattered missing teeth and generalized periodontal disease believed to be related to traumatic occlusion, (3) cases with extreme anterior overbite, (4) cases in the adult having noticeable Class II malocclusion.

An example of a case of extreme anterior overbite in which repositioning of the mandible is indicated is presented in Figures 2 and 3. The existence of an extreme anterior overbite is obvious. In addition, the patient had reported discomfort and pain in the jaws on occlusal pressure. Cases of this type sooner or later develop bone loss and suppurative periodontoclasia around those teeth (Fig. 3). Also the mandibular retrusion associated with the overbite results in improper interdigitation in the bicuspid and molar regions (Fig.

2), and this predisposes those teeth as well to periodontal breakdown.

Periodontal treatment in such cases, carried out without accompanying reduction of the overbite, can be only partly successful. Shortening of the teeth by grinding is obviously contraindicated since the amount of shortening required to reduce the overbite sufficiently to eliminate traumatic occlusion would irreparably damage the teeth. What is commonly known as opening the bite is the only alternative. However, if the overbite is reduced by conventional methods, that is, by simply increasing the vertical distance between the jaws, and without jaw repositioning, a space, actually an exaggerated overjet of the upper beyond the lower incisors, is created. Under such conditions the lower incisors usually elongate in an effort to find occlusal antagonists. The result may be reestablishment of an excessive overbite with even more serious consequences.

On the other hand, when the jaw is brought forward at the same time the bite is opened, a natural and atraumatic relation of the anterior teeth is established, and occlusal relations of the posterior teeth are likewise improved (Fig. 4). Under such circumstances the treatment of periodontal disorder results in maximum improvement, as may be observed both in the final study models and roentgenograms (Figs. 4 and 5). It will be observed that the ridges are parallel and the teeth properly aligned, making possible balanced neuromuscular activity.

There are many other types of cases in which it has been considered that the vertical intermaxillary dimension should be increased. But simple bite opening without jaw repositioning too often has been found to be as unsatisfactory in such cases as in the type of case cited, and sometimes has led to conditions even worse than the initial one. Even in some cases of abnormal occlusion in which it is assumed by the dentist that bite opening is not needed, the procedures usually followed often have failed to give completely suc-

cessful results, the underlying reason for this being that in such cases a mandibular malposture may have been present. And treatment for periodontal disease or for the relief of pain or discomfort cannot give the needed basis for mouth health unless and until the mandible is brought into its optimal postural relation to the maxilla as a fundamental part of the treatment program. At times, however, the jaws may remain in correct relation despite some degree of closure which may occur due to normal wear or other factors.

The preventive aspect of oral orthopedics is of the greatest importance. Children should be watched for any tendency to form habits which would lead to faulty development of the jaws and consequent malposture. Observation should also include assessment of systemic factors which might unfavorably influence growth and development.

Repositioning of the Mandible a Sound Procedure

Dentists have been led to believe that the original position of the mandible found on examination, even if recognized as unfavorable, cannot safely and properly be changed. However, results in cases observed over a period of years have demonstrated that repositioning the mandible is a biomechanically sound procedure. The important point, then, in indicated cases is not *whether* but *how*.

It is obvious that jaw repositioning, a technique having such important potentialities for patient comfort and health, must be done with exactness, starting with diagnosis and continuing to completion of the case.

Diagnosis

With regard to diagnosis, it is important to study each case from the preventive as well as the corrective viewpoint. In this area it is necessary to supplement the standard diagnostic technique with certain additional procedures and to correlate the findings of all elements in the study.

Diagnosis begins with the usual

intra-oral x-ray survey, the making of study models, clinical examination, both intra- and extra-oral, and history.

Determination of the existence of jaw malposture then requires the consideration of the following conditions:

(1) The relation of the mandible to the maxilla.

(2) The posture of the head on the spine as it may be influenced by jaw position.

(3) The condition of the structures in the temporomandibular region as shown by the temporomandibular roentgenogram.

(4) Whether or not the position of the mandible in relation to head posture is such as to cause any compression of or impingement on the structures contained in the upper part of the neck.

Lateral and Anteroposterior Head Roentgenograms—In order to determine the latter points it is necessary to take straight lateral head and anteroposterior roentgenograms showing the head and the entire cervical spine. (It may sometimes be necessary also to take lateral-oblique roentgenograms of the neck for further analysis of such compressions.) Such roentgenograms often give surprising information about relations to which dentists have heretofore felt it unnecessary to give their attention. Figure 6 shows such a lateral head roentgenogram in a case of mandibular retrusion. Its salient features can best be realized when it is compared with the lateral head roentgenogram of the same case with the jaw temporarily brought forward into proper anterior relation by protrusion (Fig. 7). Note the reduction in curvature of the cervical spine, the improved posture of the head on the spine and the widening of the pharyngeal space between the mandibular rami and the spine.

Procedure for Mandibular Repositioning

Necessity for repositioning the mandible is determined by consideration of all the factors in the case, including study of the models mounted

on a special analyzer devised by Stoll (Fig. 8). When the diagnosis indicates that mandibular malposture exists and that it will therefore be necessary to change the position of the mandible to bring about correct jaw relations, the instrument is used to determine the direction and extent of movement required.

Analyzer a Precision Instrument—
The instrument is so designed that its lower, mandibular, member can be moved forward, backward, and from side to side. It can also be tilted and rotated. Thus it is possible to bring the mandibular model into the best attainable relation to the maxillary model. The maxillary model is mounted in correct relation to the three planes of orientation. It is clear that restorations can then be planned to conform to the jaw position established on the analyzer. Guesswork or trial and error is thus eliminated.

Position of Condyle Head Changed
—Repositioning the mandible necessarily implies changing the position of the condyle head in the mandibular fossa. That this is permissible is indicated by studies of the evolution

of this joint, anatomic evidence, and on the proving ground of clinical experience. Recent literature by the authorities cited corroborates this opinion.

Muscle Re-education Needed to Establish Correct Posture

When the total diagnostic and prognostic study indicates that repositioning the mandible is needed, the extent and direction of repositioning required to meet the needs of the case are determined with the aid of the analyzer. With this decision made and the optimal position determined, the patient is instructed and actually trained, to use the muscles in a manner which will bring the mandible into the desired relation. The object is to eliminate various habit patterns and develop correct neuromuscular patterns. In many cases it is necessary to make a temporary appliance to assist the patient in maintaining the correct mandibular posture and provide a comfortable and balanced occlusion in the new jaw position. There are cases, however, in which all natural teeth are present and appliances are not needed; in such cases elimination of interfering cusps or other occlusal disturbances together with muscle re-education, will enable the patient to bring about optimal postural jaw relations.

Muscle re-education is continued

until the new mandibular relation and correct muscle habits are thoroughly established. Construction of a permanent prosthesis and restorations of individual teeth as needed for the final harmonizing and balancing of the occlusion are then carried out. Both the structural and functional phases of treatment must receive equal consideration. The analyzer and its accessory parts are used at intervals to check the progress of the case.

Conclusion

Oral orthopedics is not proposed as a new specialty in dentistry. Actually it is a part of general dentistry and must be so practiced. At the same time it is a fact that many of the conditions which will be diagnosed and treated by oral orthopedic procedures are conditions outside the mouth, and this therefore projects the dentist into the medico-dental field.

Results in cases treated in accordance with the principles and procedures indicated in this article have been highly gratifying to patients, and they have proved to dentists who have treated such cases that the principle of jaw repositioning in cases where it is indicated is sound, and its application practicable.

30 West 74th Street.

Note: In a later article the group will present in greater detail its views of the structural and functional aspects of the dental apparatus and discuss the views of others who have made studies in this field.

*The Group for Orthopedic Research in Dentistry now consists of J. E. Curry, D.M.D., A. A. Friend, D.D.S., G. D. Kudler, D.D.S., M. M. Lieb, D.D.S., and R. Ritt, D.D.S. Acknowledgment is made to Victor Stoll, D.D.S., whose many years of study, research, and clinical experience led to the formulation of principles from which the philosophy and systematized technique of oral orthopedics have been evolved.

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Construction of an Efficient

ELECTRODEPOSITION APPARATUS

MAURICE MALSKEY, A.B., D.D.S., New York

DIGEST

The dental profession in general considers the copper-plated die a superior die for the following reasons: (1) It is a perfect positive reproduction of the impression, (2) it is free from expansion or contraction, (3) it is hard enough to allow finishing of the casting on the die, (4) neither gold nor porcelain is affected by it, and (5) it is easy to manipulate and is inexpensive.¹

This article gives step-by-step instructions for constructing an efficient electrodeposition apparatus. The price of each part required is given and a discussion of the possible defects which may cause imperfect results and the means of overcoming them is included.

Method of Depositing Copper Plate

In electroforming, a nonconducting material (compound or wax or alginate impression) is made a conductor by coating it with a metallic powder (copper or silver) in contact with the copper band. This is attached to the cathode of the electrodeposition apparatus. The anode is pure copper. Both are immersed in a copper-plating bath (acidified copper sulphate solution). When the current

flows, a copper plate is deposited on the impression.

Apparatus for Copper Plating

The apparatus to be used for electrodeposition requires the following items:

1. A source of low voltage direct current.
2. A method of regulating the current flow.
3. A current reading device.

A low voltage direct current may be obtained from wet or dry cells but these require frequent changing or recharging.

The unit described herein utilizes the common 105-120-volt, alternating current source. The parts necessary to construct the apparatus are readily obtainable.

Construction of the Apparatus

The approximate cost is given for each of the following parts which are required to construct the apparatus:

1. One "on-off" switch (SPST), 125-volt type, can be bought at a hardware store or radio parts supply house. Price \$0.35.
2. A bell-ringing transformer (such as the Snapit) available at any hardware store. Primary input 110 volts AC, secondary output 6-10 volts. Price \$1.25.
3. Dry disc full wave magnesium-copper sulfide rectifier, Mallory IB8R, available at a radio supply house. Price \$1.76.

4. Variable resistor or potentiometer, 0-200 ohms, 2-4 watts. Clarostat 58-200 or similar unit. Can be purchased at a radio supply house. Price \$0.73.

5. 0-150 milliammeter direct current reading meter, which can be purchased at a radio supply house. Price \$1.40.

6. Copper Anode (Hanau), available at a dental supply house. Price \$1.00.

7. Cathode holder. The author uses a stainless steel strip about 1/2 inch x 3 inches (Fig. 2). It is wrapped in wax to protect it from the plating solution. The part contacting the cathode is, of course, not covered.

8. A suitable box to hold the apparatus; one about the size of a cigar box will do. It should be of bakelite or metal.

9. A glass container to hold the plating solution. This should be about 4 inches wide, 10 inches long, and 3 inches deep, and is available at variety stores.

10. Copper-plating bath:

Copper sulphate 34 ounces
Sulfuric acid 5 ounces
(concentrate)

Distilled water q.s. 1 gallon

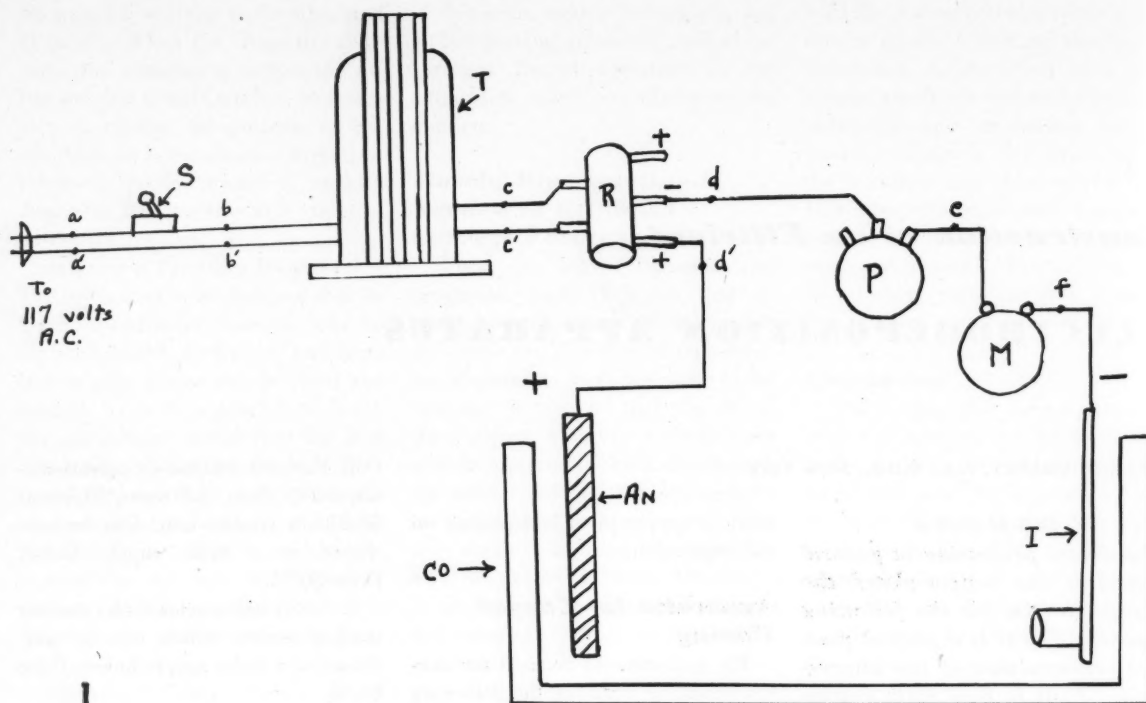
(Caution: Add the acid to the water, not the water to the acid.)

Mechanical Arrangements

The apparatus is hooked up as shown in Figure 1. Note that the input to the rectifier is the side that has two terminals, and the output is the side that has three. Note also that for the positive terminal either of the two outside terminal lugs of the out-

Note: Radio parts supply houses: Terminal Radio Corporation, 85 Cortlandt Street, New York 7, N.Y.; Radio Wire Television, Inc., 100 Sixth Avenue, New York 13, N.Y.; Allied Radio Corporation, 833 West Jackson Boulevard, Chicago 7, Illinois.

¹Matt, E. M.: Electroforming and Its Application in Dentistry, Brit. Dent. J. 77:69-73 (August) 1944.



1. (An) Copper anode. (Co) Glass container. (I) Impression holder. (M) Meter. (P) Potentiometer or rheostat. (R) Rectifier. (S) Switch. (T) Transformer.

put may be used as they are connected internally. This connection must go to the copper anode. The center terminal is the cathode.

Use of Clothespins—A wire may be wrapped around the impression holder to connect it to the cathode of the apparatus. However, the author uses spring clothespins to transmit current to the impression holders and can plate five impressions at once.

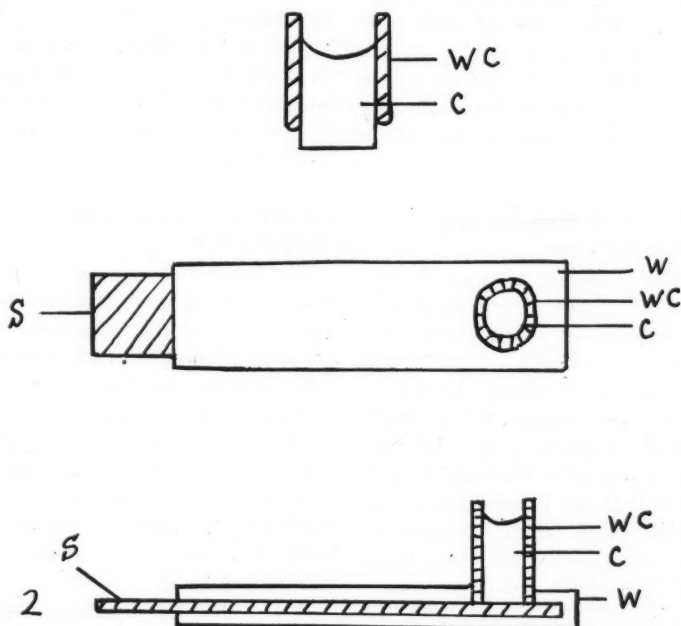
Method—(1) Five clothespins are mounted to a wooden upright. (2) A nut and bolt is passed through each as shown in Figure 3. (3) A single wire passes around each bolt and is held by the nut in each case. This wire is connected to the negative terminal of the apparatus.

Copper Anode Should be Soldered—The copper anode comes with a wire strung through a hole. This should be soldered to the anode proper because copper sulphate crys-

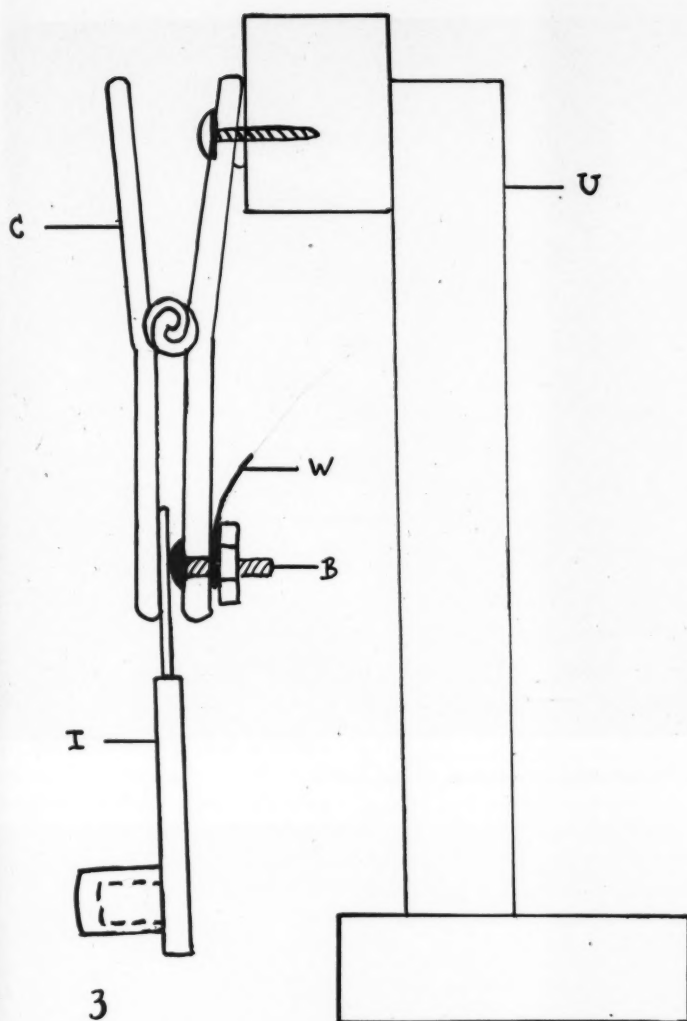
tallizes in this hole and prevents flow of current. The soldered part should not be immersed in the plating solution. Or low fusing metal can be poured around the wire and hole.

Technique for Use of the Apparatus

1. Dry the impression. Trim compound from bottom of band so that



2. (C) Copper band. (S) Steel strip (stainless steel). (W) Wax covering steel strip. (WC) Wax chimney around impression band.



3. (B) Nut and bolt passing through clothespin. (C) Clothespin (spring type). (I) Impression holder. (U) Wooden upright. (W) Wire running around each bolt and thence to cathode of apparatus.

the band can contact the steel strip (Fig. 2, C).

2. Apply oil to the impression sparingly so that it is completely covered but no free oil is present.

3. Dust on copper dust or graphite and burnish it with the brush until the impression presents a polished appearance. Less difficulty will be experienced with one of the commercial preparations, such as Sylbrite. Complete this step before the wax chimney is made.

4. Wrap the wax chimney around the band, extending several millimeters above the impression end but

short one millimeter from the opposite end (Fig. 2, A). Attach to steel strip and seal with wax (Fig. 2, B and C). Note that the copper band contacts the steel strip.

5. Apply a surface tension reducer to the impression, such as 1 per cent aerosol. Flush carefully with copper-plating solution.

6. Immerse in plating solution, being careful not to trap any air bubbles, and attach to cathode terminal.

7. Turn on switch. Use approximately 30 milliamperes for each average sized impression in the bath, and up to 50 milliamperes for a large

full crown. Check the plate after thirty minutes, redust any bare spots if present, return to the solution, and plate overnight.

8. Remove the impression, flush with water, dry, and pour root part in low fusing metal or artificial stone.

Analysis of Imperfect Results

1. If the surface of the die is uneven one of the following factors may be the cause:

a. Too much oil was placed in the impression.

b. Powder was not burnished in well or excess powder was not removed.

c. The initial amperage may have been too high. In this case the color will be reddish.

d. If root material shows through, insufficient powder was dusted in or redusting was omitted when it was necessary.¹

2. If no current flows the following tests should be made:

a. The solutions must be fresh. Use at a temperature above 65 degrees Fahrenheit.

b. Substitute an ordinary nail for the impression holder and place in the solution. If the current flows, the copper band was not contacting the steel strip of the impression holder.

c. If the current does not flow, check the connections of the copper anode. If nothing is wrong, the fault is in the apparatus. However, in two years' use by the author, no part of the original apparatus has as yet failed.

Further Tests for Lack of Current

—Three bulbs will be needed for the following tests for current: a 110-volt bulb, a 6-volt bulb, and a 3-volt bulb, each in its respective socket with 12-inch leads attached to each. (A 3-volt bulb is a flashlight bulb.)

(1) Place a 110-volt tester across a-a' as shown in Figure 1. If the bulb lights, current input is satisfactory.

(2) Place the same across b-b' (the switch must be on, of course). If the bulb lights, the switch is satisfactory.

(3) Place a 6-volt tester across c-c' (Continued on page 414)

Ameloblastoma—

Conservative

Treatment

with Favorable

Results

M. HILLEL FELDMAN, D.D.S.,
New York

D I G E S T

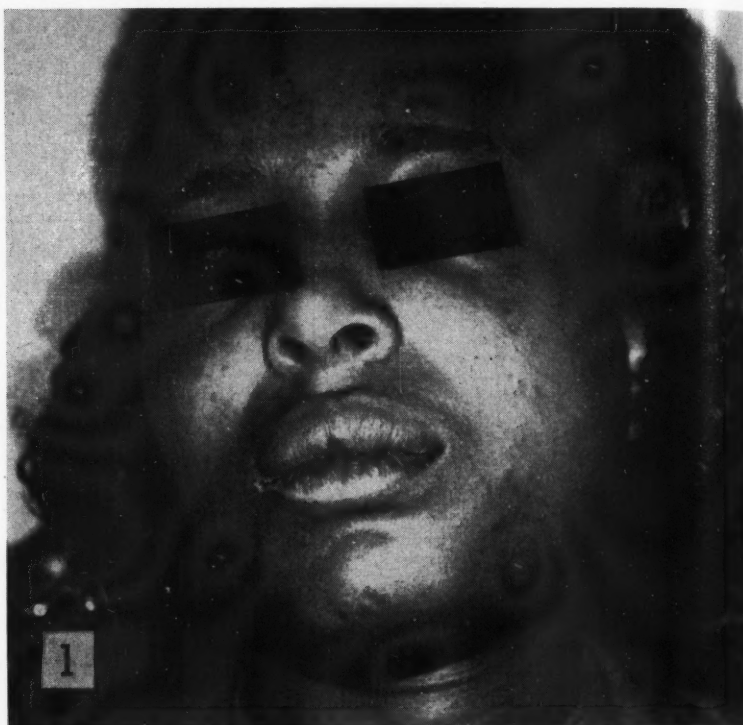
This is the case report of a young woman who presented all the classic symptoms of ameloblastoma and who has recovered without the deformity usually attending radical surgery.

Previous History

The patient, a female, aged 22, was hospitalized for treatment of a swelling of the left side of the face. A history was given of treatment for incomplete abortion a year and a half previously. The patient was in the hospital four months for treatment for an intestinal obstruction which had developed. Surgery was resorted to for this condition.

Three months prior to the present admission the patient noticed a click in the jaw while chewing with subsequent swelling of the left side of the face which progressively in-

Author's Note: Gratitude is expressed to Daniel Gottlieb, D.D.S., member of the dental staff of Lincoln Hospital, for the photographs which are used to illustrate this case report.



1. Preoperative photograph of the patient.



2. Intraoral photograph taken immediately prior to second operation.

creased in size but was not excessively painful.

Physical Examination—1. Breast or axilla, no masses. 2. Cardiac exam-

ination, satisfactory. 3. Pelvic and rectal areas, no masses.

Initial Impressions—1. Mandibular neoplasm. 2. Bone cyst. 3. Adam-

antinoma. 4. Giant cell tumor.

The mass in the left side of the face was 6 millimeters in diameter, fluctuant and crackling to touch, suggestive of cystic changes.

Initial Treatment—Aspiration of 70 cubic centimeters of yellowish, slightly cloudy fluid caused reduction of swelling.

Consultation—In medical consultation the following measures were advised: (1) extraoral surgery, (2) curettage of bone cavity, (3) application of zinc chloride, and (4) packing cavity with bone chips.

Surgical Steps Taken

The operative note on the patient's hospital record contained the following information:

1. Cyst wall excised in part. Cyst wall remaining was cauterized with phenol and alcohol.

2. Bone chips from the iliac crest were placed in defect.

3. The outer cyst wall lay just under the masseter muscle and was easily cut by scissors.

Surgical Problem—The following description of the surgery completed was made by the surgeon: An attempt to remove the inner wall presented the possibility of entering the oral cavity. The lining was therefore only partly removed and was then cauterized with phenol and alcohol. A layer of oxycel gauze was placed over the inner alveolar nerve, then bone chips, and sutures were then taken.

Dental Consultation—About two weeks later the patient was seen by the author in the out-patient department of the hospital. The wound was apparently healing satisfactorily. The swelling of the face persisted, however.

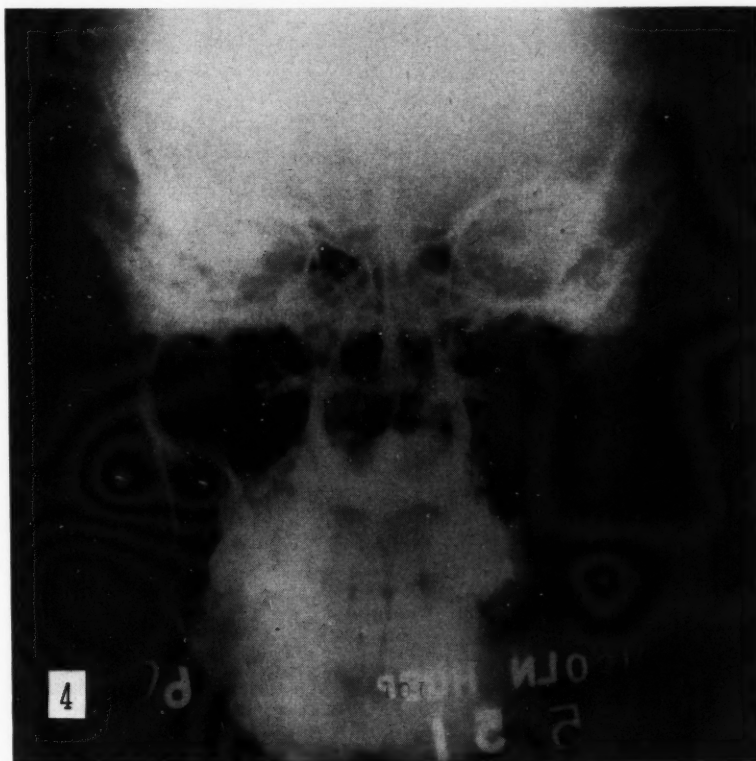
Progress of Case—During the next four months the patient reported regularly to the out-patient department clinic. She complained of pain and showed symptoms of a deterioration of the condition.

Second Hospital Admission

Seven months after her first admission the patient was admitted to the hospital for the second time. Diagnosis by the admitting physician



3. Radiograph taken at time of second admission to hospital showing extensive destruction of the ramus with only the outline of the mandible, coronoid process, and condyle undestroyed.



4. Anteroposterior view showing area of tumor destruction.



5. Radiograph taken shortly after surgery was performed by the author.



6. Radiograph taken nine months postoperatively showing regeneration of the bone of the left mandible and ramus.

was that of a dentigerous cyst of the mandible.

Examination—According to the hospital record sheet, examination now revealed the following conditions: The patient, a twenty-three-year old female noticed a mass arising from the left jaw a year and a half ago. Incision was made of the dentigerous cyst at that time. Defect was packed with bone chips from left iliac crest. Since discharge, the patient has noted recurrence of the mass in the same area. Readmitted for excision.

Case Referred to Dental Surgeon—At this time, approximately a year and a half after initial surgery, the case was referred to the author for a second operation.

Results of Examination—Examination by palpation showed the following conditions: 1. A swelling of the left mandible about 12 x 12 centimeters in size. 2. The mass was firm and smooth, and firmly attached. 3. There were no palpable nodes. 4. Considerable enlargement intraorally involving the ridge and the ascending ramus, with the superficial mucosa slightly cyanotic in appearance.

X-ray Examination—Roentgenographic examination revealed (1) marked osteolysis involving the ramus and the body of the mandible, (2) several shell-like cystic compartments, with the inclusion of the six-year molar in the tumor, and (3) the position of the tooth showed the effect of displacement by growth of the tumor.

Radical Resection Advised—The resident surgeon urged the advisability of radical resection of the jaw. The author decided to attempt a conservative operation, and a thorough intraoral curettage. The author's opinion was that he was dealing with a condition more serious than that of a dentigerous cyst.

Operative Procedure

Under local anesthesia the following surgical steps were taken:

1. An incision was made along the internal oblique line of the left mandible and the soft tissues were widely retracted.

2. A window was created in the

cyst cavity and the contents enucleated piecemeal by rongeur and curette to bare bone in all directions.

3. The cavity was packed with iodoform gauze and gelfoam to control hemorrhage.

Diagnosis of Adamantinoma Confirmed—The laboratory report definitely confirmed the author's tentative diagnosis of adamantinoma.

Pathologic Report—A similar report made by the hospital pathologist was the following:

Results of tissue examination: (Gross) Specimen consists of numerous pieces of thickened whitish tissue the size of a small egg which were apparently part of a cyst wall. In several of these, there is found some small, firm, yellow-white nodules, the largest being 0.5 centimeter in diameter.

(Microscopic) Sections show a solid and cystic adamantinoma. The solid areas are reticulated and show ameloblasts lining fronds of reticulated stroma.

(Diagnosis) Adamantinoma.

Patient Discharged—The author continued to see the patient in the hospital for approximately two weeks when she was discharged to the care of the out-patient dental clinic.

Postoperative Observation—During the three months following surgery the patient reported regularly to the dental clinic. X-ray examination revealed that the bone was regenerating. The swelling was subsiding. The patient had begun to resume her normal duties and was feeling much improved in general.

Facial Contour Restored—Nine months after the second operation the patient's normal facial contour had been restored, she experienced no discomfort, and roentgenographic examination showed that filling-in of bone had progressed to a remarkable degree.

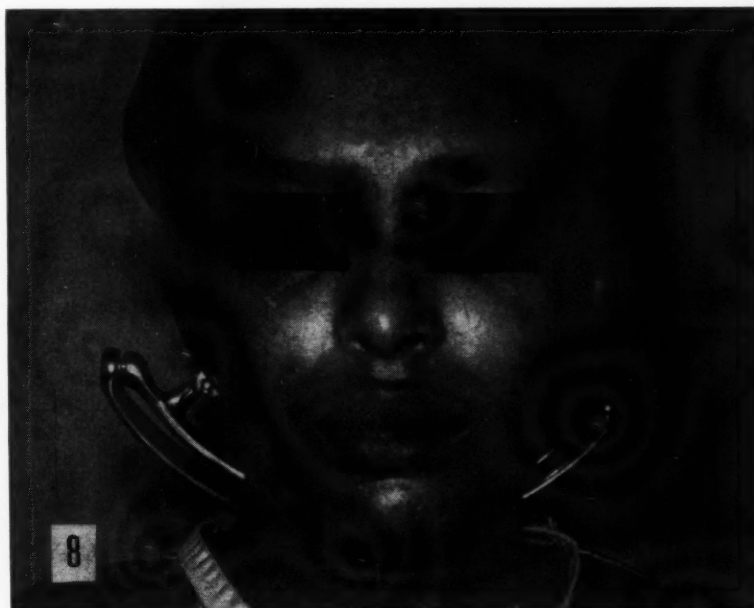
Conclusion

The author has been particularly gratified at the successful outcome of this case because he operated conservatively against the opinions expressed by the medical and surgical services of the hospital.

730 Fifth Avenue.

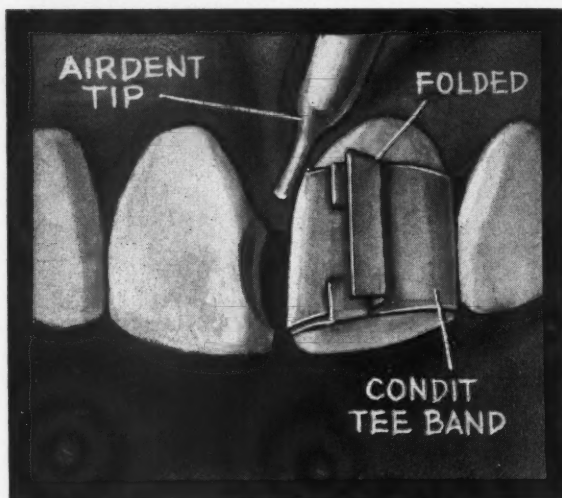


7. Intraoral photograph of healed area approximately nine months after surgery.



8. Photograph of patient showing restoration of facial contour nine months after the second surgical procedure.

1



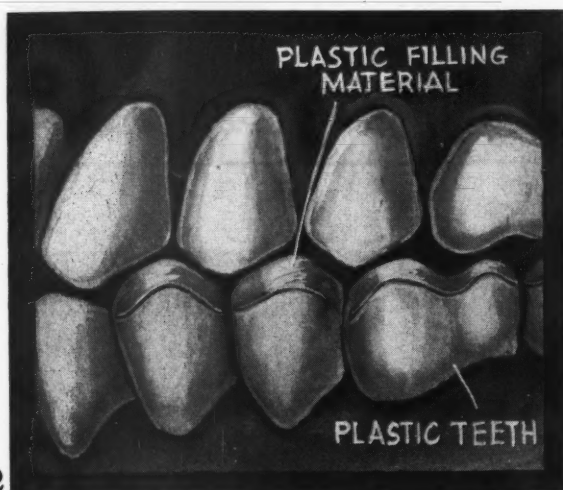
Clinical and Laboratory

The Use of the Airdent on Class III Cavities

Leonard F. Menczer, D.D.S., West Hartford, Conn.

1. The Airdent is ideal for use in the preparation of Class III cavities, yet etching of the enamel on the adjacent tooth may result. It is suggested, therefore, that the large Condit Tee band be adapted to the proximating tooth for protection against injury.

2

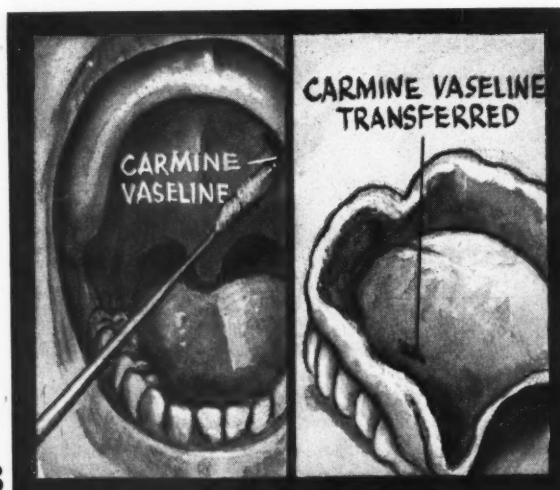


Perfecting the Occlusion of Artificial Appliances

K. Clond, D.D.S., Muskogee, Okla.

2. To perfect the occlusion where plastic teeth are used, cut retention in the occlusal surfaces of the acrylic teeth. Apply a mix of one of the self-curing acrylics. Cover with cellophane and have the patient close into occlusion. In about ten minutes the acrylic will be hard enough to trim and polish.

3



Recording a Sore Spot Under a Denture

E. S. Ulsaver, D.D.S., New Rochelle, N.Y.

3. Mix pulverized carmine powder with vaseline. Dry the denture and the soft tissue. Place a small amount of the colored vaseline directly on the sore spot. Seat the denture and remove immediately. A red spot on the denture will locate the area that should be relieved.

READERS are Urged to Collect \$10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay \$10.00 on publication.

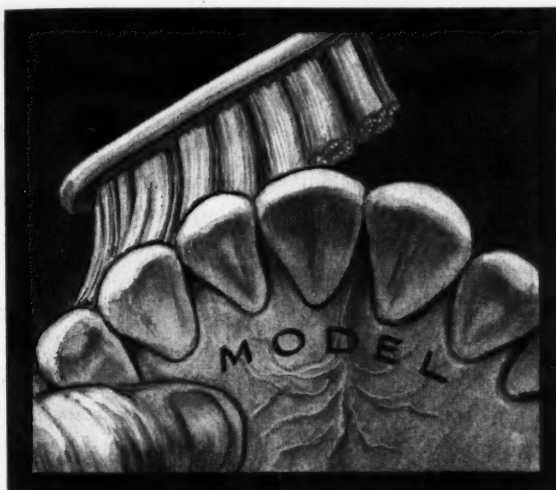
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Use of Study Models in Teaching Toothbrushing

Milton Goldstein, D.D.S., Newark, N.J.

4. In teaching a toothbrush technique to a patient use the patient's study models to indicate whatever special considerations may be involved. For example, overlapped teeth, large interdental spaces, pockets, narrow arch areas, and poor contacts.

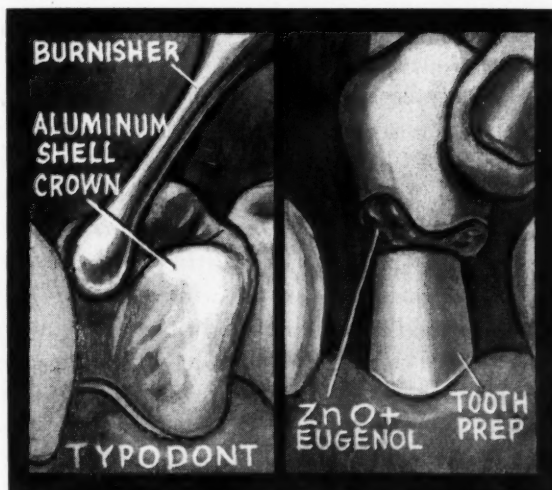


4

A Contoured Temporary Aluminum Shell Crown

Bernard H. Weltman, D.D.S., Brooklyn, N.Y.

5. Select an aluminum shell crown of the proper size. Place the crown on the corresponding tooth of a typodont. Burnish the occlusal with a pear-shaped burnisher to produce the proper occlusal pattern with cusps, fossae, and marginal ridges. Adjust the gingival contour of the crown to fit the prepared tooth in the mouth. Cement with zinc oxide-eugenol paste.

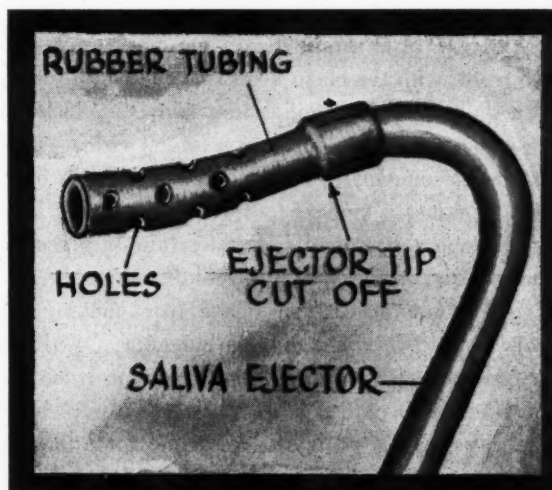


5

A Rubber-tipped Saliva Ejector

Jack J. Tressler, D.D.S., Brooklyn, N.Y.

6. Cut the end from a metal saliva ejector. Fit a piece of rubber tubing to the cut end. Using a sharp instrument, make a series of small holes in the soft tubing. Such a saliva ejector will not pinch tissue, will not clog, is easily sterilized, and will serve to depress the tongue from the operating field.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 421 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

The EDITOR'S Page

IN THE FIELD of partial denture prosthetics the dentist has in many instances abdicated his responsibility and has turned the design and fabrication of the appliance over to the laboratory technician. In these cases the dentist takes an impression with the material of his current enthusiasm and from there on accepts no further responsibility until the completed appliance is delivered to him from the laboratory. The denture is then tried in the mouth of the patient. It may, or may not, fit. If the appliance fits, the patient and the dentist are both happy. If the fit is unsatisfactory, the dentist often wrongfully places the blame on the laboratory. This approach can hardly be called the ideal professional method.*

The dentist should know enough about basic partial denture engineering and design to prescribe the kind of an appliance that he wishes to have fabricated. The dentist should know enough about basic metallurgy to appreciate the factors that may enter into the distortion of a partial denture whether it be designed with simple wire clasps or as a complete and complicated full casting. Two articles¹—one on partial denture design and the other on the distortion of gold partial castings—are worthy of study.

Lazarus describes these basic tenets of design:

"1. The simpler the design, the more efficiently the partial denture will function. Unnecessary appendages lead to an accumulation of food debris and ultimately to oral breakdown.

"2. The rests should be on the mesial aspect of the teeth, with the clasp arms extended posteriorly. (This philosophy signifies that any clasp that has its rest on the distal part of a tooth, with its arms extending anteriorly, would be attempting to brace itself against a nonexistent force. Kennedy bars, continuous clasps, and indirect retainers placed in the anterior regions of the mouth, which are designed to prevent the appliance from moving forward, would fall in a similar category. Of all the movements of the mandible, straight protrusive is the least important, since the condyle cannot brace itself against the walls of the glenoid fossa to exert maximum force. The positions which cause the

greatest amount of disturbance to an appliance are lateral protrusive and the working bite, as the muscles are always attempting to return the condyles to centric. Therefore, an appliance should be constructed to brace itself against these forces.)

"3. The clasps are intended for lateral bracing, not for resistance to tacky foods. They should be made to fit on the widest part of the tooth, and not into any undercut area. Pressure created when a clasp is in an undercut area results in too much damage to the tooth. These are the forces employed by the orthodontist to move teeth.

"4. Retention should be obtained by (a) centric force, (b) close adaptation of the clasp to the tooth, and (c) the adhesiveness of the mucosal base.

"5. In maxillary bar design, the bar should be placed as far back as possible, but with adequate latitude to function not only for rigidity, but also as a brace."

The deformation of gold partial denture castings, according to Dinger and Peyton,² is in direct proportion to the amount of heat treatment that the castings receive. "By heat treatment is meant any operation which consists of heating the casting to a high temperature and then cooling it. This included the casting process, together with the method of cooling, and the soldering, annealing, and hardening operations." There are also distortions and warpings that result from improper waxing, investing, and polishing procedures.

The dentist should supply the laboratory technician with precise specifications for the design of a partial denture and with an accurate model made from a good impression. The laboratory should follow the specifications with scrupulous care and should deliver the completed appliance *on the original model* to assure the dentist that there has been no distortion during any of the steps in fabrication. A partial denture made by a laboratory without instructions from the dentist and delivered in a pretty box may look like a jewel, it may even fit and function, but it can hardly be called the fulfillment of professional planning and prescribing.

¹Lazarus, Abraham H.: Partial Denture Design, J. Prosthet. Dent. 1:438-442 (July) 1951.
²Dinger, E. J., and Peyton, F. A.: Distortion of Gold Partial Denture Castings, J. Prosthet. Dent. 1:443-453 (July) 1951.

Squinting in Childhood

This condition is frequently neglected in infancy and childhood on the theory that the child will "out-grow the squint." Rarely does this occur; thus an early neglect may lead to a severe visual defect.

It is the duty of every professional man to call the parents' attention to the evidence of suspected squint. Treatment is highly technical, and requires the judgment and skill of the ophthalmologist, and may have to be continued for many months or even years. An uncorrected squint will not only affect the vision but it may lead to emotional changes in the child which will seriously affect his happiness and his relationships with others.

Strabismus may be classified into two different types or groups: (1) Usually noted immediately after birth, the first group is of a convergent type due to paresis or paralysis of the external recti. If it is bilateral, the child uses both eyes, the left in looking to the right and the right in looking to the left, and thus maintains visual acuity. If it is unilateral, the infant starts to fix with one eye constantly. Permanent correction is obtained surgically.

(2) The second group, the accommodative type of squint, usually begins to manifest itself near the end of the second year when the child begins play activities that require accommodation for near vision. Treatment consists of refraction and the use of glasses. If the correction of the refractive error does not correct the squint and produce parallelism, orthoptic exercises and training are necessary.

(3) The third group combines the first two groups, paresis associated with the accommodative element. Probably the largest number of squints fall in this group. Treatment requires refraction, occlusion or tropinization, orthoptic training, and surgery, the importance of each varying from case to case.

(4) The fourth group includes cases of divergent strabismus. As a rule, these are difficult to treat. Orthoptic training gives little aid. Sur-

MEDICINE

and the Biologic Sciences



gical treatment is usually necessary to obtain parallelism.

(5) The fifth group consists of the vertical imbalances. These are usually combined with some degree of lateral squint. Surgical correction is usually required of both the lateral and vertical muscles if good functional results are to be obtained.

Squint is a complicated condition and requires careful analysis to determine the best treatment to be followed. The practitioner should urge immediate study and treatment if squint is recognized or suspected.

Editorial: The Child with Squint, J. Pediat. 39:516-518 (October) 1951.



ACTH in Acute Infections

At this time it is believed that the use of ACTH or cortisone in acute infections, tuberculosis, and other more chronic infections is not warranted, especially in children.

There may be a dramatic improvement in the patient's feeling of well-being. In most instances, elevations of temperature and abnormal white blood counts return to normal. However, cultures remain positive and the bacterial sensitivity to antibiotics is unaffected. The serum antibodies are not affected. The skin reactions to bacterial antigens may or may not be inhibited although delayed reactions of

the tuberculin type are either blocked or inhibited.

ACTH or cortisone have no recognized effect on the infecting agent. They may interfere with the host's ability to react to the infection. This is supported by experimental infections in animals where the mortality rate is higher in those receiving ACTH or cortisone. There are indications that the human being is more susceptible to infectious processes and that pulmonary tuberculosis tends to increase during ACTH and cortisone therapy.

Until further investigation is completed, ACTH and cortisone should not be used in the therapy of infectious diseases for other reasons, intensive specific therapy must be instituted, and if the response is not adequate, ACTH or cortisone should be discontinued.

Barba, William P., and Cravioto-Munoz, J.: ACTH and Cortisone in Pediatric Practice, J. Pediat. 39:750-775, 1951.



Leukemia—General Considerations

Leukemia is now considered as a neoplastic disorder which arises primarily in the blood-forming organs. The leukemic cells have the characteristics of cancer cells as they exhibit definite evidences of unrestrained growth. The etiology of the condition is as obscure as is the cause of any neoplasm.

More than 5000 deaths occur in the United States every year as a result of leukemia. Recent studies have established the fact that there is a definite hereditary trend in leukemia.

There are four important pathologic changes which may occur in the disease: (1) The anemia which is almost always due to an infiltration of the bone marrow with an encroachment of the leukemic cells on the red blood cell-forming marrow tissues.

(2) Lack of resistance toward infection which is due largely to the inability of the white blood cells, both mature and immature, to protect the body against infection by phagocytosis. Patients with leukemia

apparently are unable to develop antibodies normally, possibly as the result of some unknown alteration in the hematopoietic system.

(3) Impairment of the function of many tissues of the body due largely to the leukemic infiltration. This process is an invasive one and resembles, to a certain extent, a true neoplasm.

(4) A secondary thrombopenic purpura with a diminution or absence of platelets from the circulating blood develops in all patients eventually. This is associated with an abnormal tendency to bleed. Patients with leukemia show extensive hemorrhages throughout all of their tissues at necropsy. The cause of thrombopenia is a diminution in the number of megakaryocytes (the precursors of the blood platelets in the bone marrow) due to their elimination by the leukemic infiltration.

Modern treatment employs one or more of eight types of therapy: (1) Blood transfusions, (2) antibiotics, (3) roentgen ray therapy, (4) radioactive phosphorus, (5) urethane, (6) nitrogen mustard, (7) folic acid antagonists, and (8) ACTH and cortisone.

In acute leukemia the duration of life is usually brief, varying from a few weeks to two or three months. There is evidence to suggest that with

the more effective use of roentgen ray, radioactive phosphorus, blood transfusions and antibiotics, and possibly the newer forms of treatment, not only will the symptoms be controlled more effectively but also it may be possible to prolong life.

Sturgis, Cyrus C.: Treatment and Prognosis in the Leukemias and Allied Disorders, Postgrad. Med. 9:375-382 (May) 1951.



Loss of Appetite in Children

Frequently parents are unduly concerned over a diminution of appetite after the first year in their children. Such a refusal to eat does not necessarily indicate organic disease.

A mother may feel that a food intake which is physiologically adequate appears insufficient. After the extremely rapid growth of the first year, children settle down to the decelerated rate of childhood. The food requirements are proportionately less. The appetite normally increases again about the age of 5 or 6.

Often the refusal of one or several specific foods is misinterpreted as a loss of appetite. Usually these foods are ones which the adults feel are essential to the child's well-being.

Hunger is a normal, healthy, physiologic condition. The child will not realize that eating is fun unless he is allowed to get hungry. The mealtime hunger stimulus is reduced by feeding between meals, in response to vague hunger, a desire for sweets, or the mother's fear that the child did not take enough at the last meal. A feeding problem can easily be initiated.

Food should be served to children in a pleasant atmosphere and without coercion. No comments should be made about the amount consumed. Children eat best in the company of other healthy children.

A definitely underweight child may not respond to attempts at increased food intake. Caloric intake, especially of protein, must be increased. True loss of appetite is a medical problem. The usual causes are: (1) febrile diseases, (2) gastritis, (3) constipation, (4) catarrhal jaundice, (5) anemia, (6) leukemia, (7) mental retardation, (8) lead poisoning, (9) mercury poisoning, (10) purpura, and (11) some infections which occasionally produce little fever. Excessive vitamin intake or fatigue sometimes reduces appetite.

When specific organic and environmental causes for anorexia have been eliminated the appetite may be stimulated by therapeutic measures. Five units of insulin may be given thirty minutes before meals or a small amount of crystalline vitamin B₁₂ given orally each day.

Steine, Lyon: The Child Who Won't Eat, G. P. 3:53-56 (January) 1951.



Mumps

Until recently little importance has been attached to the prevention and treatment of mumps which was considered largely a nuisance disease. Children were expected to acquire it and usually did.

There is a comparatively low communicability of mumps. As a result it is the one childhood infection which is most frequently escaped in childhood only to occur with more serious symptoms and a higher in-



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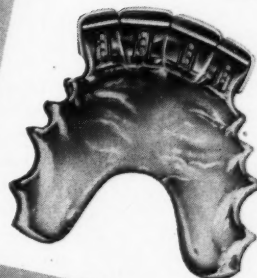
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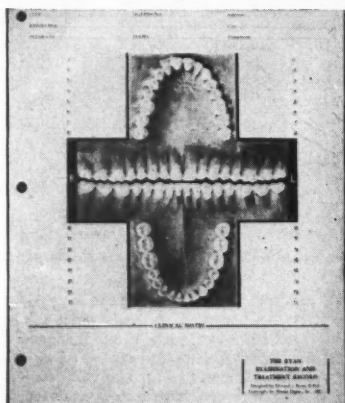
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cidence of complications in adulthood. Today children are more carefully protected against exposure, except perhaps in the case of mumps. Consequently the disease has become more and more one of adult years.

It is relatively easy to establish the diagnosis of mumps in the usual form. Principal factors noted are (1) typical swelling of the salivary glands, especially of the parotid, with some overlying gelatinous edema; (2) frequent hemorrhagic injection of the stomas of Stenson's duct; (3) the absence of purulent secretion from the duct, and (4) accompanying leukopenia.

Seldom is the disease noted in infancy and symptoms of pain and tenderness are usually mild throughout childhood. Adults may experience severe pain and general prostration. There are almost no serious effects from infection of the salivary glands; the principal significance of mumps results from the involvement of other organs. Any of the so-called complications may occur before, during, or after the recognition of parotitis without any recognizable salivary gland involvement.

The traditional complication of mumps is orchitis. This virtually never occurs in preadolescent males. It occurs in about 20 per cent of adult males with mumps and causes extreme swelling of one or both testicles with associated pain, tenderness, prostration, and apprehension.

Oophoritis probably occurs in women with comparable frequency, causing low abdominal pain and tenderness, but is less susceptible to accurate diagnosis. Central nervous system infections are extremely common in patients with parotitis.

Parotitic infection in childhood involving one or more of the salivary glands is almost invariably succeeded by lifelong immunity and is rarely accompanied by any serious sequelae. Therefore nothing should be done during childhood to prevent the disease following exposure except in unusual circumstances.

The treatment of simple parotitis should be entirely symptomatic. The patient should be kept at rest in proportion to the amount of discomfort.



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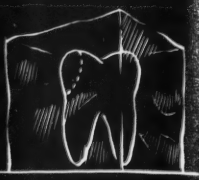
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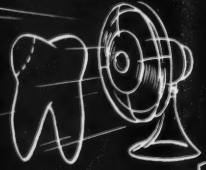



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and prostration which is evident. Antibiotics seem to be ineffective in the inhibition or destruction of the virus. Pooled adult plasma and gamma globulin obtained from normal plasma cannot be depended on for any protective effect against mumps or in the prevention of complications.

Shaw, Edward B.: *Treatment of Mumps*, *Postgrad. Med.* 9:353-355 (April) 1951.



Subacute Bacterial Endocarditis

The patient with bacterial endocarditis requires careful individualized care. Routine therapy may be dangerous.

The choice of the correct antibiotic and the proper dosage schedule are of utmost importance. Whenever possible the infecting organism should be isolated by blood culture, identified, and its sensitivity to at least penicillin and streptomycin determined. Such studies reveal which antibiotics will be most efficacious and facilitate planning of a treatment schedule.

One month is the absolute minimum duration of therapy for subacute bacterial endocarditis. Even though the patient may feel well after a week of treatment, prolonged administration is necessary to allow adequate sterilization of the bacterial vegetation in the heart.

The essence of treatment is time. A large dose of penicillin given over a few days may be followed by a relapse. The same total dose spread over a longer period may achieve a permanent cure. The masses of organisms trapped deep within the bacterial vegetation must be destroyed by the body's own defenses while the antibiotic stands guard.

The size of the daily dose of antibiotic is determined by the sensitivity studies. Organisms sensitive to 0.1 unit of penicillin or less per 1 cubic centimeter of culture can usually be cured by 400,000 units of penicillin a day. Usually, in practice, 600,000 units of penicillin is the smallest daily dose employed. This



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amount can be given as 300,000 units of procaine penicillin intramuscularly every twelve hours.

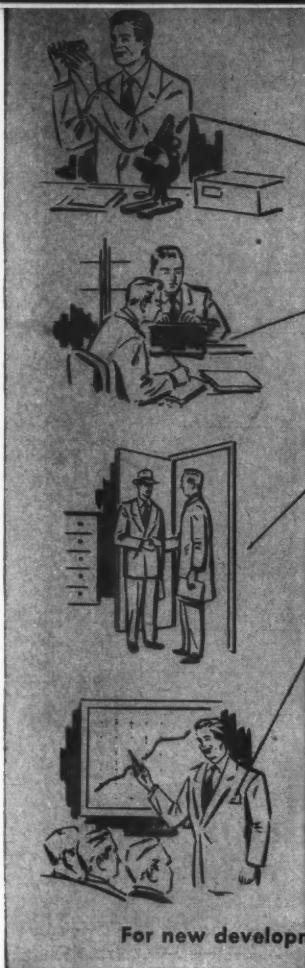
For resistant organisms, 6,000,000 or more units of penicillin should be given daily. This amount of drug is best given in six to eight divided doses intramuscularly. Crystalline penicillin should be used. Adequate doses of the drug must be given from the onset of therapy since *Streptococcus viridans* can develop increased resistance to penicillin.

Despite the high percentage of bacterial cures many patients with bac-

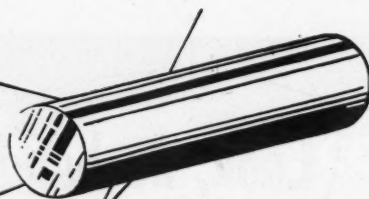
terial endocarditis die from heart failure or fatal embolism. Heart failure may develop soon after the infection is cured because of the additional valvular damage caused by the bacteria and the fibrosis incident to the healing process.

Early diagnosis of bacterial endocarditis will prevent many of these deaths.

Bloomfield, Arthur L.: *The Present Status of Treatment of Subacute Bacterial Endocarditis*, *Circulation* 2:801-810 (November) 1951.



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One Should be Strong to be President

The major candidates for President and Vice-President are four men of unquestionably rugged character and impressive integrity. Their back-

grounds are as divergent as the American nation and as varied as the American landscape. The record shows them to be within the age range of most favorable physical and mental vigor. One is young, on the threshold of forty. Two were born at the turn of the century. The other is within a few weeks of his sixty-second birthday. They are neither callowed youths nor bumbling senescents. I wish to add a word, however, as a quasi-biologist.

We have been frequently reminded that the strains of the Presidency are terrific on any human organism. The protocol that must be lived under, the

social functions with boring and ambitious people, the momentous decisions that must be made, the complete lack of privacy, the stream of glad-handers and favor-seekers would try the patience, the endurance, and the understanding of any man. Patience, endurance, understanding are psychic, physical, and spiritual traits—in fact, the three values form an inseparable triad. A man, therefore, to be equipped for the Presidency should have more than the average endowments of physical, mental, and spiritual health. I think on this we will all agree. The question is to decide among us on a method to assess and measure the degree that a person possesses strength of mind, of body, of spirit.

I will grant that there are no standards of measurement for many human values. No one has yet made a device to measure the height of love or the depth of grief. An emotion is a complex experience; a reaction that involves thought, feeling, and action. To date, an emotion has not been photographed or recorded on an electronic device, or seen in a test tube or under a microscope.

We have been more successful with our measurement of "physical" things (the quotes around *physical* mean that there are no actual separations within the triad of physical, mental, and spiritual). We have x-rays, electrocardiographs, chemical tests, and an array of instruments that are useful in physical medicine. We agree that these are not infallible devices in the hands of man but they do give important clues to the functioning of the human organism.

The degree of spiritual strength may be reflected in the loftiness of one's thoughts, his words, and more accurately, in his actions. The spiritual is largely a private domain, a universe in which each man wanders alone, a land where man is completely free and where he should not be disturbed by violations of his privacy.

Every campaign manager insists that his candidate, and his alone, possesses all the virtues and all the strengths of the soul, the body, and the mind. This, of course, is an absurdity. Every campaign manager in-

sists that his candidate, and his alone, has the composite personality of Washington, Jefferson, and Lincoln with a hint that the prophets and the saints of old have a generous representation in his candidate's personality. This is likewise an absurdity.

The objective biographers of the great Americans—Washington, Jefferson, Lincoln—have shown that these fine and human men were subject to the ills of the body, that they had moments of irritability, indecision, and despair. They also had lusts of the flesh and spiritual doubts. And certainly among the prophets—Jeremiah, Job, and Isaiah—were men who recorded human sorrow and human imperfections. Nor did Saul of Tarsus and Augustine of Hippo describe themselves as men of perfection. On the contrary, their power over the centuries on the lives of men may be explained because they described in simple powerful words their own weaknesses as they struggled for *The Strength*.

I have not forgotten that I set out to comment as a quasi-biologist, and as one who has seen in the dental infirmary, the medical clinic, the teaching hospital, and in practice the psycho-physical-spiritual sufferings of thousands of human beings. I have also seen many of these people restored to useful and stress-free living by the skills of physician, nurses, and dentists. I have seen others not improved at all, some actually harmed, and a few die. The biologic arts and sciences are far short of perfection, but they certainly represent as honest an effort and as sincere a dedication as any human activity. It is incongruous, therefore, that these skills are completely ignored among politicians when they seek a candidate for the exalted position of the Presidency.

One may not qualify for the most lowly office in civil service without passing a physical examination. One may be offered, however, as a candidate for the Presidency who is suffering from a grave and incurable disease. It has been done. A man is forced to retire from active work in many businesses and from some governmental positions when he is sixty-

five on the theory that his skills and abilities begin to wane after that age. There is nothing to prevent him from offering himself as a Presidential candidate at any age past thirty-five.

When the lives and fortunes of millions of people throughout the world may depend upon the decisions of a President of the United States, it is important that he be a man in the best physical, mental, and spiritual health. The decision to drop an atom bomb, or more fearfully, a hydrogen bomb, a law or regulation that involves the food supply, the shelter,

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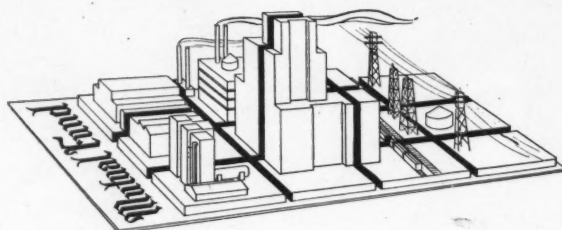
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the employment of millions of people are not decisions to be made by an emotionally unstable, a petulant, a casual, or a reckless man. These decisions must be made after soul searching by a man who is in robust total health.

Although it is too late in this Presidential campaign to suggest a Medical Board of Review it is not too early to propose such a Board for 1956 to evaluate potential candidates in advance of their nomination. The events of the next four years may convince the American people of a

In your ORAL HYGIENE this month



How to Invest Without Speculation

Do you know the difference between investment and speculation? John Y. Beaty quotes "a cynic's definition": "Investment is a successful speculation and a speculation is an unsuccessful investment."

However, one can invest with maximum safety in certain types of mutual investment programs. Mr. Beaty explains four of these programs, classified as to objective: (1) Monthly income, (2) Generous income, (3) Income and growth, and (4) Capital growth.

★ ★ ★

"Is the General Practitioner Due for a Style Change?" The starched dental coat may be on the way out, if a new type of shirt-coat proves as comfortable and convenient as its initial trial indicates. A dentist who rebelled against the constricting, uncomfortable traditional coat had his wife tailor a garment to take its place. Perhaps this departure from precedent is a straw in the wind indicating a new direction for dental fashions.

★ ★ ★

"Since the shake-ups in the Bureau of Internal Revenue, responsible employees are showing a noticeable reluctance to be lenient with taxpayers, lest this be misconstrued as a 'fix,'" says Harold J. Ashe in warning the dentist to "Beware of Tax Liens." He urges every professional man to take care that his returns are accurate, for carelessness in meeting tax obligations can undermine a reputation.

"Make Mine Minors," says Doctor Lee A. Kapilow, explaining that he reluctantly accepted an invitation to talk to a school group—and, much to his surprise, found the experience stimulating and rewarding.

"Those children," he reports, "were an absolute revelation to me. Their questions came in such abundance that I was always about five children behind in my answers. And the questions were virtually all intelligent, appropriate, and to the point."

Perhaps Doctor Kapilow's experience will encourage you to take part in your community's program when National Children's Dental Health Week rolls around, and you, too, will agree with his conclusion: "I would not miss it for the world!"

★ ★ ★

"Do You Fear Ridicule and Humiliation?" Do you dread discussing unpleasant details—such as fees—with your patients? Doctor Joseph Murray discusses the "complaint type" of dentist and patient, and explains that aloofness and meekness are often expressions of the same basic fear. He offers sound counsel to those who suffer from the type of anxiety that expresses itself in excessive submission or in undue self-assertion.

★ ★ ★

Pictures tell the story, "New Air Force School Graduates Technicians." Fifty-two young airmen from twenty-nine different states were the hand-picked first class.

need for such a Board. I have no confidential medical information from any source. All I know of the physical, mental, and spiritual health of the candidates is what I have pieced together from newspaper sources, from their appearance, from their talks, and from their actions. Sometimes these are revealing sources of information, more revealing than "scientific" inquiries. I have my own ideas on the potentials of the psychophysical-spiritual strength of the candidates but to express these views would be the foulest kind of quackery. I would like to think that in the future years we would know from an impartial medical review what we were getting in the way of health with our candidates. Health always meaning the total and inseparable triad—a sound body, a clear mind, a serene spirit.

—E. J. R.

Construction of an Efficient Electrodeposition Apparatus

(Continued from page 397)
as shown in Figure 1. If the bulb lights, the transformer is functioning.

(4) Place a 3-volt tester across d-d'. If the bulb lights, the rectifier is functioning.

(5) Place the same tester across d'-e. If the bulb lights, the rheostat is not at fault. (Make sure it is turned to zero ohms resistance.)

(6) Place the same 3-volt tester across d'-f. If the bulb lights, the apparatus is functioning.

(Caution: Take proper precautions when testing the 110-volt circuits.)

General Suggestions

1. Do not spill any of the plating solution on clothes.

2. Place a mark on the container to indicate the original solution level. Replace evaporated liquid with distilled water to original level before each use.

3. Two drops of phenolsulfonic acid in the plating solution will increase the throwing power of the solution and yield a better plate in the deeper parts of the impression.

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Facial Nerve May be Involved—It is mentioned by one investigator that in some cases the extraglandular part of the facial nerve may be involved as the parotid does not always envelop this nerve where it crosses the retro-mandibular space. Such a paralysis, however, should not last long, nor would satisfactory anesthesia be expected in these circumstances, as the inferior dental nerve must be a considerable distance away. But it is found that anesthesia is usually excellent, as in the case reported.

Experimental Injections—Another

investigator made 100 deep experimental injections, depositing the solution as close to the facial nerve as possible, and failed to obtain paralysis in 57 cases. Of the 43 successful ones, only 20 were complete. On 27 occasions the paralysis was only partial. It was found that the partial cases developed slowly, while all but 4 of the complete type developed quickly.

Injection by Direct Approach—Injection was then attempted of the facial nerve at the exit of the mastoid foramen by a direct approach through

the skin near the ear. Even then paralysis was obtained in only 17 out of 50 cases and all these were slow in onset. It was suggested by this authority that the slow type of paralysis is due to the anesthetic action of the fluid on the conduction of the nerve and that this action is much more difficult to obtain with motor nerves than with sensory nerves (*vide* results of direct injection).

Accidental Paralysis of Rapid Type—The same experiment suggests that the accidental paralyzes met with in dental practice are all of the rapid type which is evidence against the accident being due to the direct action of the anesthetic solution on the nerve.

Conclusion From Experiment—The conclusion drawn from this experiment is that the paralyzes are due to a vasomotor reflex, the exact mechanism of which is unknown.

Theory of Circulatory Upset

The results of another research project suggest that Bell's palsy is a pathogenic entity in which the main feature is a "dysregulation" of the circulation which probably takes place near the stylomastoid foramen. The result of this upset of circulation is that the nerve becomes edematous and thus compressed in its bony canal. This causes further restriction of the vascular supply and a vicious circle arises.

Factors Affecting Speed of Paralysis—The speed with which the paralysis begins, its extent and duration, depend on (1) the size of the blood vessel originally affected, (2) the degree to which it was blocked, and (3) the rapidity with which the circulation is re-established. In many cases of Bell's palsy there is pain in the ear with color changes of the drum, symptoms which may be explained as vascular phenomena similar to those causing the ischemic paralysis.

In the case described herein the patient also complained of ear pains.

Possible Vasomotor Reflex Implication—If these conclusions be accepted, a paralysis of six weeks' duration following an injection of an

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anesthetic solution could easily be explained on the assumption that the solution (particularly its adrenal content), or even the mechanical action of the needle itself, gives rise to a vasomotor reflex.

Occasional Association Possible— The sympathetic plexus associated with the external carotid has communication via the deep auricular with those fibres covering the stylomastoid artery and, as has been shown, a deeply injected needle may come very close to the external carotid artery. The sensitivity of the sympathetic system to stimulation varies considerably from patient to patient, so that such a vasoreflex may only occasionally be associated with a deep inferior dental injection.

Summary

It would appear that (1) facial paralysis following inferior dental injections may be due, in some cases, to the direct action of the solution on the nerve, (2) that in others it is the result of a vascular reflex which causes an ischemic paralysis in the region of the stylomastoid foramen. In the former cases the duration of the paralysis is approximately the same length as the anesthesia, while in the latter cases it may be much longer, depending on the degree of damage to the nerve.

Adapted from *British Dental Journal* 91:292-293 (December 4) 1951.

Subacute Bacterial Endocarditis

THOMAS H. HUNTER, M.D.

Disease Not Easily Cured

Until the last decade subacute endocarditis was one of the most fatal diseases known to man. Although it has been shown that now, with intensive and carefully managed antibiotic therapy, between 80 and 90 per cent of patients can be cured, many patients are still dying of bacterial endocarditis unnecessarily.

Reasons for Fatalities—Some of the reasons for fatalities among patients with bacterial endocarditis are



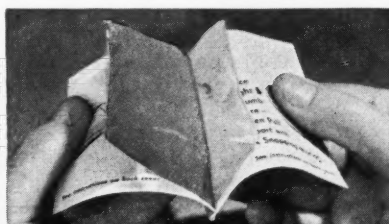
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the following: (1) Failure to establish the diagnosis early, (2) failure to detect penicillin-resistant infections, (3) insufficient therapy, (4) failure to administer penicillin to all patients with valvular heart disease at the time of tooth extraction, cystoscopy, and other operations in infected fields.

The Offending Organism—In about 90 per cent of cases the offending organism is a streptococcus of the non-hemolytic variety. Although most of

these bacteria are sensitive to penicillin, an increasing proportion are highly resistant.

Varying Sensitivity Shown—Since various strains also show widely varying sensitivity to streptomycin, aureomycin, and chloromycetin, the physician may be forced to determine the sensitivity of the organism to different antibiotics in each individual case.

Physicians must educate themselves to think of bacterial endocardi-

tis in any patient with valvular heart disease who runs an unexplained fever for more than a few days. In such cases multiple blood cultures should be taken even though other signs and symptoms are absent.

Other Common Findings—Although not necessarily present the following conditions may be seen: (1) Petechiae, (2) a palpable spleen, (3) clubbing of the fingers, (4) joint pains, (5) tachycardia, (6) changing heart murmurs, (7) elevated sedimentation rate, and (8) microscopic hematuria.

Osler's nodes, which are tender pea-sized nodules appearing in the pads of fingers and toes and subsiding in a week or so, are virtually diagnostic of the disease.

Clinical Manifestations are Protean—(1) Emboli to cerebral vessels cause a variety of neurologic abnormalities, some transitory and some permanent. (2) In elderly patients particularly, attention may not be especially drawn to the heart. (3) Murmurs are often unimpressive at first and constitutional symptoms may predominate, leading to a suspicion of malignant disease, tuberculosis, and other chronic infections. (4) Kidney involvement may be so prominent as to suggest a primary diagnosis of nephritis.

Diagnostic Certainty

The findings of several positive blood cultures constitute the only final means of clinching the diagnosis.

Positive Blood Cultures Obtained in Over 90 Per Cent of Cases—Although transient bacteremia due to infected teeth is common, repeated recovery of non-hemolytic streptococci from the blood is almost never found except in subacute bacterial endocarditis.

Sooner or later in this disease positive blood cultures can be obtained in over 90 per cent of cases.

Several Cultures Should be Taken—In certain situations the organisms may grow very slowly and not be detectable in culture flasks until after three weeks' incubation. At least five or six blood cultures should be taken and incubated for three weeks before

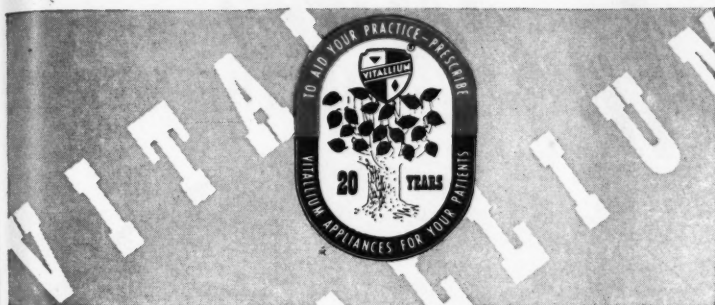
being discarded as negative. Cultures can be taken at hourly intervals if necessary so that therapy need not be too much delayed.

Penicillin Therapy

The first patients successfully treated with penicillin have now been followed almost ten years. Certain principles related to therapy are well established: (1) Anticoagulants are not indicated, (2) sulfonamides are of little value, (3) the optimal duration of a course of therapy is probably from four to six weeks, (4) daily doses of 2,000,000 units of

penicillin are recommended for patients with penicillin-sensitive infections (inhibited in vitro by 0.1 units per cubic centimeter, or less); (5) the safest method of administering penicillin is intramuscularly every three hours day and night.

Treatment of Resistant Cases—In those cases which resist therapy good results have been obtained using very large doses of penicillin, 10,000,000 units a day or more, plus streptomycin in doses of two to three grams daily. Treatment of resistant cases must be highly individualized, and guided largely by the sensitivity of



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the infecting organism to the available antibiotics singly and in combinations.

Variations in Response to Treatment—Although many patients show a prompt subsidence of all clinical signs of active infection within a few days, some continue to have disturbing features throughout treatment. If blood cultures remain positive for more than a few days in the face of therapy, it is strong evidence that treatment is grossly inadequate. Clinical evidence alone may be quite misleading in the appraisal of a patient's status. Information concerning

the sensitivity of the infecting organism to antibiotics must also be obtained.

Large Percentage of Cases Curable—If treatment is intensive and controlled by careful bacteriologic studies, the infection can be cured in 90 per cent of cases. Accidents, such as emboli or ruptured mycotic aneurysms, which are the cause of most deaths, can probably never be avoided completely, but they can certainly be reduced by early diagnosis and treatment.

Approximately 25 per cent of patients with bacterial endocarditis

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give a history of tooth extraction preceding the onset of the disease. A significant number of infections also follow instrumentation of the nasopharynx or genito-urinary tract.

Prevention Therapy—While it does not seem possible to prevent bacteremia completely at the time of these procedures, there is evidence that bacterial endocarditis can be prevented in susceptible patients by sufficiently intensive antibiotic prophylaxis.

The Patient Should be Warned—It is the physician's responsibility to educate all patients with valvular or congenital heart disease of the need for such prophylaxis. They should be warned never to allow operations to be performed without telling the dentist or surgeon of the instructions they have had.

Prophylaxis Regimen—Very few cases of bacterial endocarditis have been reported following tooth extractions in patients receiving penicillin in doses of 100,000 units every three hours intramuscularly starting at least six hours before operation and continued for at least 48 hours.

In patients who cannot be hospitalized, procaine penicillin 500,000 units twice daily for the same period is recommended.

Sulfadiazine has not proved adequate and several cases of bacterial endocarditis have developed during treatment with full doses of this drug.

Adapted from *Heart Bulletin* 1: No. 2, 27-29 (May-June) 1952.

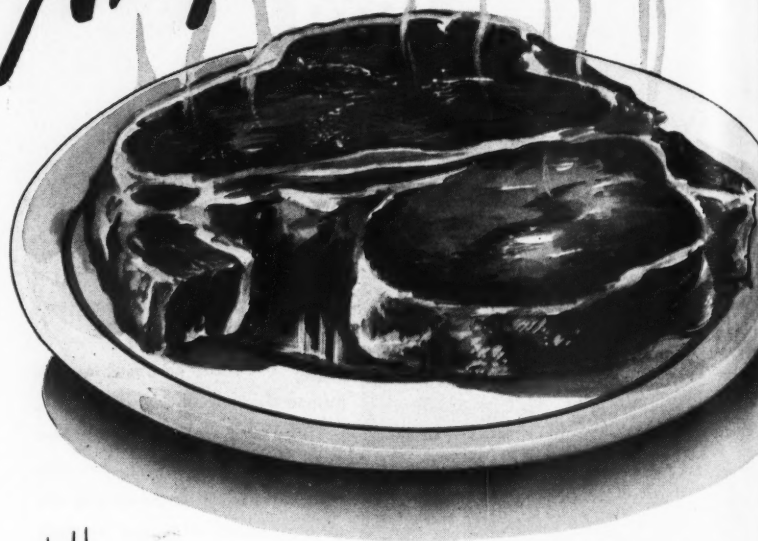
Water Fluoridation— Public Health Aspects

Dental caries is probably the most prevalent of all diseases to which mankind is subject. It affects virtually the entire population. At ages 20 to 35 our young men on the average present 4.2 teeth lost, 1.0 tooth to be extracted, 7.2 carious tooth surfaces requiring restorations, and 9 out of 10 mouths in need of bridges, partial or full dentures.

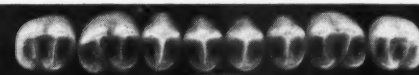
Dental health is receiving greater attention in public health programs today. Much progress has been made in several lines of caries prophylaxis.

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cedures designed to improve the health of the consumers. The treatment procedure is subject to general supervision and control by health departments in a manner long established by practice. The type of equipment is identical to that used in the application of other water treatment chemicals. The qualifications of operators responsible for the control of water fluoridation equipment are similar to those governing the qualifications of water-chlorination plant operators.

The treatment has been in practice long enough to produce evidence that a potential reduction in new caries in children by 60-65 per cent may be expected. Its beneficial effect is to prevent, not to cure, dental caries. This results from the optimum level of 1 part per million. Most waters naturally contain some fluoride. The objective of water fluoridation is to control the concentration of the fluoridation at the optimum level. This is true of waters containing excessive fluoridation and those deficient in

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provision of satisfactory laboratory facilities and qualified laboratory personnel to determine the concentration of fluorine in the raw and treated water.

Adapted from *American Journal of Public Health* 41:1370-1373 (Nov.) 1951.

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(See pages 402 and 403)

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